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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,044	09/13/2002	Ray Fli Lee	RD-29708	2581

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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EXAMINER

VARGAS, DIXOMARA

ART UNIT PAPER NUMBER

2859

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N :

10/065,044

Applicant(s)

LEE ET AL.

Examiner

Dixomara Vargas

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-17, 19-22 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-17, 21, 22 and 24 is/are rejected.
- 7) ☒ Claim(s) 7, 8, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 9-17, 21-22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Jakob et al. (US 6,289,232 B1).

With respect to claims 1 and 13, Jakob discloses a method for reconstruction for use in a parallel MRI system wherein a plurality of MR detector coils are arranged in an array (Abstract) and each coil has a corresponding spatial sensitivity profile, the method comprising (Column 10, lines 17-36): detecting a plurality of gradient-encoded MR signals from the plurality of detector coils (Column 10, lines 37-55; Figure 1, #20a, #20b ... and #20i); and, processing the detected MR signals with at least one filter bank to reconstruct at least one image (Column 21, lines 52-56; Figure 1, #18).

3. With respect to claims 2 and 14, Jakob discloses the step wherein the plurality of MR detector coils comprises a spatial filter bank formed with the respective sensitivity profiles for spatially filtering the plurality of detected MR signals (Columns 10 and 21, lines 17-36 and 52-56 respectively).

4. With respect to claims 3 and 15, Jakob discloses the step wherein the detector coils are arranged to optimize the spatial encoding of the spatial filter bank (Column 10, lines 37-55; Figure 1, #20a, #20b ... and #20i).
5. With respect to claims 4 and 16, Jakob discloses the step of using the SMASH method (this method uses a numerical fitting routine to, among other things, interpolate a decimated number of phase-encoding steps and thus, achieve reductions in scan time) which is considered to be the claimed step that involves collecting a decimated plurality of gradient-encoded MR signals to generate a plurality of decimated signals, and the processing step comprises the steps of; interpolating the plurality of decimated signals to generate a plurality of interpolated signals (Column 8, lines 37-67), and, applying at least one of a lapped transform and a synthesis filter bank to reconstruct interpolated signals (Column 6, lines 50-67).
6. With respect to claims 5 and 17, Jakob discloses the step wherein the decimated gradient encoding consists of reduced phase encoding steps (Column 10, lines 37-55).
7. With respect to claims 9 and 21, Jakob discloses the step wherein the at least one image is substantially free of aliasing and amplitude distortion (Column 21, lines 59-67).
8. With respect to claims 10 and 22, Jakob discloses the step wherein the sensitivity profiles of the array are overlapping and further comprising the step of applying a lapped transform to the detected signals during the processing step (Column 23, lines 20-48; Figure 1B).
9. With respect to claim 11, Jakob discloses the step wherein the array is a strip array comprised of a plurality of array elements each element being a linear strip (Figure 1B, C1-C4).
10. With respect to claims 12 and 24, Jakob discloses the step wherein the array comprises a strip array of a plurality of conductive strips, each strip having a corresponding phase

relationship to a spatial location within an object to be imaged in the MRI system and the processing step comprises encoding each of the corresponding phases to reconstruct the at least one image (Abstract; Figure 1B).

Allowable Subject Matter

11. Claims 7, 8, 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

a. With respect to claims 7 and 19, the claims have been found allowable over the prior art because the prior art fails to teach or fairly suggest a method of reconstruction usable in parallel MRI systems comprising an intermediate filtering step of applying an intermediate filter bank between the decimated gradient encoding and interpolating steps for stabilizing the processing step for reconstructing the at least one image.

b. With respect to claims 8 and 20, the claims have been found allowable due to its dependency on claim 7 and 19 above.

Response to Arguments

13. Applicant's arguments filed on 03/08/04 have been fully considered but they are not persuasive.

14. Applicant argues that Jakob fails to teach or fairly suggest processing means by which the MR signals are processed using at least one filter bank to reconstruct the image.

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15. The examiner disagrees with applicant arguments because Jakob discloses the process of reconstruction on the computer which includes the step of Fourier transforming (processing data step well known in the art for transforming the acquire data to an image format) the fully characterized data to form low pass filtered coil sensitivity weighted images which are processed (Column 21, lines 52-56). It is understood from the previous recitation that detected NMR data is being processed with FT and during the reconstruction process (using FT) the data is being filtered. Therefore, Jakob discloses the claimed invention that recites "processing the detected MR signals with at least one filter bank to reconstruct at least one image".

Conclusion

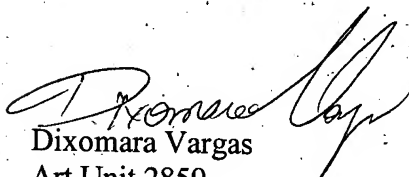
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dixomara Vargas whose telephone number is (571) 272-2252.

The examiner can normally be reached on 8:00 am. to 4:30 pm..

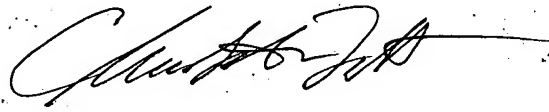
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dixomara Vargas
Art Unit 2859
May 28, 2004



Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800

CHRISTOPHER W. FULTON
PRIMARY EXAMINER